B I D D I N G D O C U M E N T

for

The work of Design, Engineering, Construction and Commissioning 10 MLD STP with TSPS at SMV layout,Kommaghattaand Operation & Maintenance for Seven Years.
(DBO contract)

Contract Package –
BWSSB KOMM-VRI- BDA

National Competitive Bidding (NCB)

EMPLOYER'S REQUIREMENT

VOLUME 2 of 4

SEPTEMBER– 2023

Employer: Bangalore Water Supply and Sewerage Board

Country: India

PART 1

PROJECTDETAILS

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PART -1

PROJECTDETAILS

1.1 Background to the Project

The Bangalore Water Supply and Sewerage Board (BWSSB) is committed to providing drinkingwater in sufficient quantity and to treat the sewage generated to the required standards. BWSSBpresently serves BBMP and surrounding villages covering about 800 Sq.km.The collected sewage fromcertain areas of SMV-BDA layout in Ramasandra will be treated in Sy No. 53 and Sy No. 57 upstream of Kommagatta lakeWorks Details for Contract Package

The proposed system under thisContractconsists of construction ofTerminal Sewage Pumping stations located at the sewage treatment plant site, and Sewage Treatment Plants.STP, TSPS and allied works shall be on a Design Build Operate basis with Seven (7) years Operation Service Period (Operation and Maintenance) under appropriate Conditions of Contract

1.2 Component List for Works

Following table shows the design average flow capacitiesof STP with TSPSs.

S.No.	Valley	STP Name/ TSPS	Average Flows (MLD)	
			Initial Design @ Year 2038*	Ultimate Design @ Year 2053**
1	V Valley	10 MLD STP at SMV layout Ramasandra Sy No. 53 and Sy No. 57 upstream of Kommaghatta lake All Sewer laying and connections from the last Manhole to proposed TSPS is part of this contract	10	13
2	Pumping main	200mm dia , 2 km length		

*STP shall be provided for the year 2053flows and pollution loads with treatment process as follows:

- **SBR with Biological Nutrient Removal (Nitrification, De-nitrification, and Phosphorus Removal), with Disc filters, Chlorine Disinfection and Sludge Dewatering.**

**All the TSPS shall be provided for the year 2053flows (civil works) except that the number of pumps and its mechanical/electrical equipment which shall be provided for the year 2038flows as specified in this Bidding Document.

1.3 Scope of Work

The Scope of Work under this contract includes but is not limited to the following in relation to the design, build (construction) and operation and maintenance of the Works, which are to be implemented under Works:

- All preparatory work including clearing and leveling of site, site grading, formation of Finished Ground Level (FGL), construction of internal roads, all around compound wall etc., excavation, dewatering as required and disposal of all surplus earth to a suitable location as specified/directed by Engineer.
- Topographical survey, geotechnical investigation, and any other investigation complete.
- All existing facilities that are to be demolished to accommodate STP/TSPS shall be properly de-commissioned, removed, stacked and appropriately disposed of by the Contractor after getting the approval on its Salvage value as directed by Engineer.
- Demolishing shall be carried out in accordance with all applicable laws, regulations, and standards. Items, components, or materials, whether buried, exposed, submerged, or otherwise, shall not be abandoned or left on site unless explicitly specified.
- Preparation of process and hydraulic designs with layout, process flow diagram, piping and instrumentation diagram, mass balance and hydraulic flow diagram of the complete STP including TSPS as stipulated in scope.
- Preparation of GA Drawings, Unit Process/Equipment/Facility/Building layouts,etc complete.
- Detailed sizing, design, and engineering, of all treatment units, buildings, structures, and equipment (including all civil, mechanical, electrical, architectural, instrumentation, control, automation, and SCADA components).
- Submission of detailed engineering designs, drawings, calculations, and data sheets as per requirements of Bidding Document.
- Design, construction, testing and commissioning of all civil structures, building works, bypass lines and other pipelines complete.
- Design, construction, testing and commissioning of all allied pumping mains, bypass lines and other pipelines complete
- Procurement, supply, installation, erection, testing and commissioning of all mechanical, electrical, instrumentation, PLC/SCADA system complete.
- Design, construction, and commissioning of all pipelines, flow meters, channels, outfall structure for the disposal of plant effluent from chlorine contact tank to nearby water body at each site complete.

- Design and construction of approach road, all internal plant roads & internal storm water drains, curbs, pavements, parking spaces, compound wall, retaining walls, culverts, nalla diversion works complete.
- Design and construction of complete plant water supplyfor potable and non-potable purpose including plant sewerage system.
- Interconnections with other works as required complete.
- Plant testing, commissioning, stabilization, demonstration of performance guarantee.
- Submission of Operation and Maintenance Manuals.
- Providing training services to Employer's personnel including O&M staff.
- Complete plantation and landscaping works to give pleasant environment of build out campus.
- Preparation and submission of As-Built drawings for all civil, mechanical, electrical, Instrumentation, SCADA works complete.
- Receiving Raw Inlet Sewage at site and discharge of Plant Effluent to nearby water body as specified in Employer's Requirements.
- Real time online monitoring systems at Inlet & outlet of STP, auto sampler and laboratory equipment complete.
- PLC based SCADA system for fully automatic & safe operation of each STP and TSPS.
- Wireless Communication System for remote monitoring of STPfrom Central SCADA Station at Shimsha Bhavan / Cauvery Bhavan as well as wireless communication between STP SCADA.
- Auxiliary systems like CCTV monitoring of each STP, TSPS.
- Transportation and disposal of screening, grit and dewatered sludge cake as specified in Employer's Requirements.BWSSB will indicate the land for disposal of sludge in the vicinity beyond 20kms radius of STP.
- Seven (7) years Operation and Maintenance for STP/TSPS in this Contract after successful passing of the Tests on Completion of Design-Build and Issue of the Commissioning Certificate as per the Conditions of Contract given in Volume1 of the Bidding Document.
- Overflow from units shall be to the nearby SWD/Lake.
- Handing over the facilities.

Notes:

1) *Contractor to submit Unit Process / Equipment / Facility / Building wise Construction Approach and Methodology, prior to start of each/any type of constructional activity at site.*

1.4 Additional Scope Details for Civil Works

The scope of work for STP and TSPSshall include all civil works as per process requirements, including other facilities as listed below.

General points to be noted and implemented for all STPs &TSPs

Approach Roads with gatesshallbe provided for STP site.

1. Plant internal roads shall be at least 3.5m wide with one side RCC drain. Additionally, 1.50m shoulder shall be provided for future expansion for a minimum length of 290m.
2. Parking sheds in Steel Structure with RCC foundation pedestal and corrugated MS sheets for roof of not less than 50 Sqm for all STP's shall be provided.
3. The undulated ground shall be properly graded up to the site FGL for all the STPs and TSPS sites. The FGL shall be 1.0m above the HFL for all sites.
4. HFL provided in this document is for the guidance. Further the same shall be ascertained during execution by confirmatory Geotechnical report, as per site requirement and shall get approved from the Engineer in charge.
5. STP sitesshall have approach road of 10m width from available road running in front of the gate and connecting internal roads for a minimum length of 20m.
6. The information provided in this document are only the minimum requirements at the site. The contractor shall visit the site and Bid as per the actual site requirements. No additional claim or variation shall be allowed in case, if there is any change in minimum requirement.
7. The HFL, FGL and EGL provided below are to be field verified by the Bidders.
8. 450mm thick Stone soling shall be provided for all buildings and minor structure foundations below PCC to improve the strength of the soil and also under waterlogged conditions.
9. All trees, vegetation shall be removed after obtaining necessary permissions from the concerned authority and instructions of Engineer in Charge.

1. STP and TSPS

1. New RCC precast compound (over pile foundation)of minimum 110 M to be provided near the entrance of the STP.
2. Compound wall with 450mm wide Size stone masonry(SSM) with a height of 1.50m and 1.00m shall be provided over the existing compound wall for a length of 150m and 50m respectively. A plinth beam of M25, size 450x300 shall be provided above the existing SSM wall. A coping concrete of 450x200 shall be provided above the new SSM wall in M15. Barbed wire fencing for a height of 1.40m in 6 layers shall be provided with angular sections (65X65X5) inserted in SSM(minimum100mm to be inserted in SSM)
3. Pile foundation (450 dia End bearing piles)shall be considered for all units

4. New RCC storm water drain of 4.0m wide and 2.50 m height to be provided for a minimum length of 120m.
5. Chainlink fencingabove FGL, shall be provided near drain for a minimum length of 150m
6. Two RCC deck slabs over existing stormwater drain infront of gates to be provided.Existing Stormwater drain to be strengthened if required
7. The HFL of the site is +797.00m.
8. The FGL of the site is +798.00m

1.5 Funding Agency and Financing

Funds for the Contract are being provided by theBDA (DCW).

1.6 Treated Effluent and Sludge Characteristics

Thetreated effluent characteristic for all the STPs shall comply with the following discharge standards given in the Table below:

Parameters	Unit	Value
Treated Effluent Discharge		
pH - Instantaneous range		6.5 - 8.0
BOD_5 at 20^0C- Maximum monthly average	mg/L	≤ 10
COD - Maximum monthly average	mg/L	≤ 50
TSS - Maximum monthly average	mg/L	≤ 10
Total Nitrogen - Maximum monthly average	mg/L	≤ 10
Alkalinity - Minimum instantaneous	mg/L as $CaCO_3$	≥ 70
Total Phosphorus - Maximum monthly average	mg/L	≤ 1
Residual Chlorine - Instantaneous	mg/L	~ 0.75
Fecal Coli-form - Maximum monthly average	MPN/100 mL	≤ 100
Sludge for Disposal		
Maximum VSS/TSS ratio	%	≤ 65
Solid Concentration in Dewatered Sludge	%	≥ 20
Grit for Disposal		
Organic Content in Grit	%	≤ 5

1.7 Site Conditions

Each Plant shall be designed and constructed taking into account the following:

Annual Average Ambient Temperature : 27° C (Minimum 15°C - Maximum 45° C)

Relative Humidity (maximum) : 75 %

Site Conditions : Tropical

The plant shall be designed to suit the ambient temperature mentioned above with the Contractor making due allowance in his designs for the increased temperatures experienced by Plant exposed to direct sunlight.

1.8 Minimum Design Life

The Plant components shall be designed and constructed to provide the minimum service life listed below for each component.

Reinforced Concrete Structures	:	60Years
Buried Piping	:	60 Years
Other Civil Structures	:	50 Years
Steel Structures	:	50 Years
Buried Earth Electrode System	:	40 Years
Mechanical Equipment	:	20 Years
Electrical Equipment	:	15 Years
Control Panels	:	15 Years
Instrumentation Systems	:	10 Years
Diffusers	:	7 Years
Computer System	:	7 Years
All type of Server and Computer based Software’s	:	Should be updated to latest version

1.9 Access for Other Contractors

The Contractor shall allow reasonable access to other Contractors engaged on the Site or on areas adjoining the Site to carry out their work.In the event of a dispute over access or priority between Contractors, the Engineer shall be informed in writing. The Engineer shall inform all parties concerned in writing of his decision.

Where any part of the Works is associated with or in physical contact with plant supplied under a separate contract, the Contractor shall satisfy himself that the work carried out by the other Contractor is consistent with the correct operation of the Plant. In the event of the Contractor considering any work being carried out or any work already completed to be detrimental to the ultimate operation of the Plant, he shall report the matter to the Engineer.

If the work of the Contractor is delayed because of any acts or omissions of any other contractor, the Contractor shall have no claim against the Employer on that account other than for an extension of time.

Details of other Contracts taking place on the same Site or adjoining the Site include but are not limited to the following:

1. Providing and laying trunk and laterals sewers and house connection chambers under Package CP 27 and other BWSSB works.
2. Regular operation and maintenance works of existing sewers, ISPS, TSPS and STPsby BWSSB.

1.10 Survey and Geotechnical Data

Contractor shall carry out independently fresh survey, geotechnical investigation and all other details necessary for proper planning, detailed design and execution of all works under this Contract. The Contractor will be required to provide full details of the survey and geotechnical investigations of works for approval of the Employer.

1.11 Contractor's BangaloreSatellite Office

Contractor shall designate an Engineering Manager (Lead design and Technical Support) who is responsible for the complete Works design including preparation of Detailed Designs and obtaining all required Detailed Design approvals. The Contractor shall also designate Design Leads for each design discipline required. The Contractorshall mobilize the entire Design Team to a Satellite Office in Bangalore. This design office shall be in addition to its Construction Site Office.

The Satellite Office shall be staffed to facilitate and expedite submittals of Detailed Designs. Contractor shall designate a Deputy Design Manager who reports directly to the Contractor's Engineering Manager and will be stationed full-time in the Bangalore Satellite Office through the Detailed Design preparation, submittal and approvals. Contractor shall also designate Design Leads for each design discipline required stationed in the Bangalore Satellite Office who will do design production. The Deputy Design Manager and Design Leads will communicate directly with Employer's staff and its designees throughout Detailed Design preparation, submittal, review and approval, as well as during the same procedures for submittals for testing and commissioning and all other design related submittal required in accordance with the Contract. The Satellite Office Staff in conjunction with the Contractor's Home officestaff will be responsible for timely response to Employer's comments related to the Detailed Design.

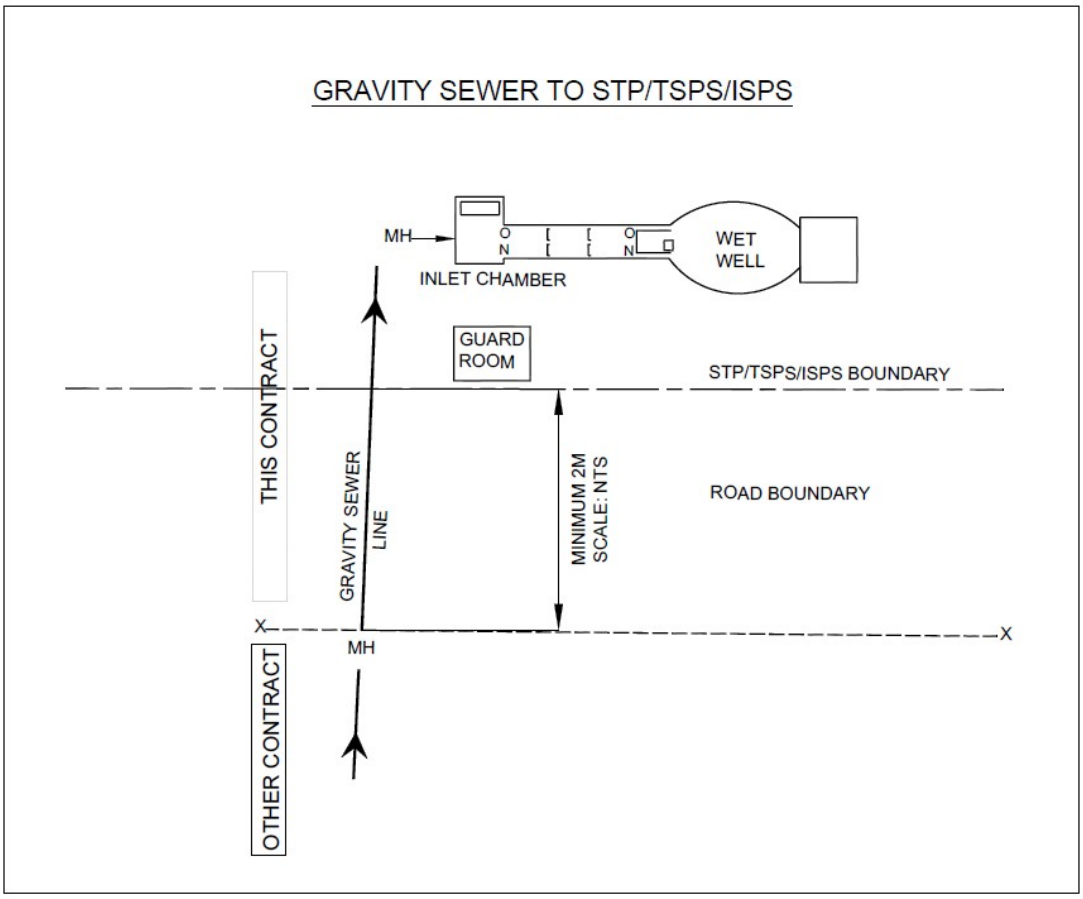
The Contractor's Engineering Manager will be responsible for the efficient coordination of the Satellite Office, Home Office and Employer's staff & its designees such that the design work proceeds expeditiously.

The Contractor shall operate and maintain its Satellite Office throughout the Detailed Design preparation, submittal and approval process. Approval of the Detailed Design shall be determined when all submittals have received a review designation of "A-Approved" and final copies of all Detailed Designs have been submitted.

1.12 Battery Limits between Works The following are the Battery Limits (interfaces between) Works - for the following cases:

Gravity Sewer to STP or TSPS

The interface between Works of gravity sewer and TSPS shall be the downstream of the manhole outside of the STP Site. The terminal manhole shall be located such that the edge of the manhole is located minimum 2 m from the centre of the fence or wall.All Sewer laying and connections from the last Manhole to proposed TSPS is part of this contract



Connections of Proposed Pumping Mains to Existing Manholes

Connections shall be made as described for Connections of Proposed Sewers to Existing Manholes.

1.13 Interface with Other Contracts

The Works under this Contract will physically interface with Works under the Contract for laying Trunk sewers / laterals. The Contractor for this contract shall co-ordinate with Employer and the Contractors for the above Contract as applicable and ensure that all interfaces are designed, constructed, installed, tested, commissioned, operated, and maintained properly to provide a fully functional system meeting all applicable performance requirements.

The Contractor for this Contract shall be fully responsible for independently field-verifying any and all information he considers relevant in order to provide a fully functional system.

1.14 Sectional Completion of Works

Sectional Completion of Works is required by the Employer and is included in Volume 1 of the Bidding Document. The Contractor shall in particular note the importance and sequence of Sectional Completion considering also the interface between existing facilities and those being implemented under a separate Contract.

The Contractor should note that the Trunk/lateral sewerswhich discharge sewage to the TSPS to be implemented under this Contract are being implemented under a separate contract, which is either in progress or completed. The Contractor shall familiarize himself with the schedule for the above Contract and monitor the progress on a regular basis.

In the event that construction of the TSPS/STP is completed before wastewater is available at a TSPS/STP, the Contractor shall properly maintain the TSPS/STP in an inactive state until such time as wastewater becomes available. Further, all the components of the plant shall be adequately secured, protected, maintained, and exercised according to manufacturers' instructions during this inactive period. This inactive period shall be considered part of the Operation and Maintenance Period.

The monthly price for maintaining each STPin this contract in an inactive state shall be decided by mutual agreement between the Employer and the Contractor as necessary.

Specified activities related to commissioning, testing, demonstration of performance shall be performed when wastewater becomes available at the STP/TSPS. No additional payment shall be made to the Contractor for such deferred activities.

End of Part 1